

wherein the carbon atom is in the α position with respect to the ethylenic unsaturation.

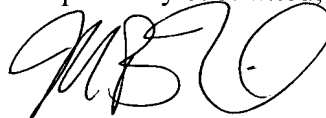
65. (New) The substrate of claim 64, further defined as an ophthalmic lens.--

REMARKS

The specification has been amended to cancel claims 1-30 of the application, and to add new claims 31-65. Support for the new claims is found in the specification and claims as originally filed. The filing fee has been calculated after amendment of the claims by the preliminary amendment. For the convenience of the Examiner, a clean set of the pending claims is attached hereto as Appendix A.

Should any additional fees under 37 C.F.R. §§ 1.16 to 1.21 be required, the Commissioner is hereby authorized to deduct said fees from Fulbright & Jaworski Deposit Account No. 50-1212/10200365/MBW.

Respectfully submitted,



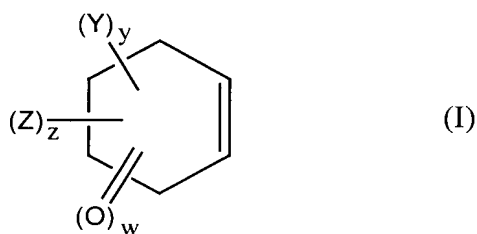
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APPENDIX A
Pending Claims

31. A method of producing photochromic latex comprising a stabilizing agent comprising:
obtaining an aqueous emulsion of a polymerizable mixture comprising a weight of
one or more organic monomers containing C=C groups that are polymerizable
by a free-radical mechanism and one or more photochromic compounds;
polymerizing the polymerization mixture to form a latex;
obtaining a composition comprising a weight of least one stabilization agent capable
of stabilizing photochromic properties selected from the group consisting of
cyclopentene compounds, cyclohexene compounds, cycloheptene compounds,
cyclooctene compounds, and compounds comprising an ethylenic unsaturation
not forming part of an aromatic ring and a carbon atom bearing a free hydroxy
group, wherein the carbon atom is in the α position with respect to the
ethylenic unsaturation; and
adding the composition comprising the stabilization agent to the polymerization
mixture prior to or during polymerization of the polymerizable mixture or to
the latex after polymerization;
wherein photochromic latex comprising a stabilizing agent is produced.
32. The method of claim 31, wherein the stabilization agent is a cyclohexene compound.
33. The method of claim 32, wherein the cyclohexene compound has the formula:



wherein:

- any Y is, independently, an alkyl group of 1 to 4 carbon atoms;
any Z is a hydroxy group, a 2-oxoethyl group, a hydroxyalkyl group of 1 to 3 carbon
atoms, an alkoxy carbonyl group of 2 to 5 carbon atoms, or a R'COOR" group

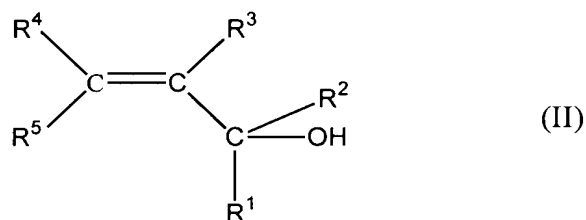
in which R' is an alkyl radical of 1 to 4 carbon atoms and R'' is an alkane di-yl radical of 2 to 4 carbon atoms or an alkylidene radical of 1 to 5 carbon atoms;
y is an integer from 0 to 3;
z is 0 or 1;
w is 0 or 1; and
the sum of z and w is 0 or 1.

34. The method of claim 33, wherein the cyclohexene compound is selected from the group consisting of cyclohexene, α -terpineol, terpinen-4-ol, α -terpinyl acetate, α -terpinyl propionate, α -terpinyl butyrate, 1-methyl-1-cyclohexene, 3-methyl-1-cyclohexene, 4-methyl-1-cyclohexene, methyl 1-cyclohexene-1-carboxylate, 3-methyl-2-cyclohexen-1-ol, 3-methyl-2-cyclohexen-1-one, 4-isopropyl-2-cyclohexen-1-one, 3,5-dimethyl-2-cyclohexen-1-one, 4,4-dimethyl-2-cyclohexen-1-one, isophorone, 2,6,6-trimethyl-1-cyclohexene-1-acetaldehyde, and 3,5,5-trimethyl-2-cyclohexen-1-ol.

35. The method of claim 33, wherein the cyclohexene compound is cyclohexene.

36. The method of claim 31, wherein the stabilization agent is a compound comprising:
an ethylenic unsaturation not forming part of an aromatic ring; and,
a carbon atom bonded to a free hydroxy group and at least one hydrogen atom,
wherein the carbon atom is in the α position with respect to the ethylenic unsaturation.

37. The method of claim 36, wherein the stabilization agent has the formula:



wherein:

R¹ and R² are both hydrogen; or one of R¹ and R² is hydrogen and the other forms,
with the R⁵ group, a C₅-C₁₀ ring, which may be substituted with one or more

linear or branched C₁-C₄ alkyl groups and/or one or more C₂-C₄ alkylene groups; or one of R¹ and R² is hydrogen and the other is a C₁-C₆ aliphatic alkyl group, a C₄-C₁₆ cyclic hydrocarbon group, or a C₆-C₁₆ aromatic hydrocarbon group;

R³, R⁴, and R⁵, independently, are: hydrogen; a C₁-C₆ alkyl group which may be substituted with one or more OH groups and may be interrupted by one or more ether, ester or ketone groups; a C₆-C₁₆ aromatic hydrocarbon group; or a C₄-C₁₆ cyclic hydrocarbon group;

R³ and R⁴ may form a C₅-C₁₀ ring which may be substituted with one or more C₁-C₄ alkyl groups or C₂-C₄ alkylene groups; and

two or more carbon atoms of any C₅-C₁₀ ring formed with R¹ or R² and R⁵ or with R³ and R⁴ may be bonded by a hydrocarbon bridge.

38. The method of claim 37, wherein R¹ and R² represent hydrogen, R³ represents a methyl group, R⁴ represents hydrogen or a methyl group and R⁵ represents hydrogen, a methyl, ethyl or CH₂OH group.

39. The method of claim 37, wherein the compound of formula (II) is selected from the group consisting of allyl alcohol, methallyl alcohol, crotyl alcohol, 2-cyclohexen-1-ol, trans-2-hexen-1-ol, cis-2-butene-1,4-diol, 3-methyl-2-buten-1-ol, trans-2-methyl-3-phenyl-2-propen-1-ol, 3-buten-2-ol, carveol, myrtenol, verbenol and trans-cinnamyl alcohol.

40. The method of claim 39, wherein the compound of formula (II) is 3-methyl-2-buten-1-ol.

41. The method of claim 31, wherein the weight of the at least one stabilization agent is 0.1 to 10% of the weight of the monomers in the polymerizable mixture.

42. The method of claim 41, wherein the weight of the at least one stabilization agent is 1 to 10% of the weight of the monomers in the polymerizable mixture.

43. The method of claim 42, wherein the weight of the at least one stabilization agent is about 5% of the weight of the monomers in the polymerizable mixture.

44. The method of claim 31, wherein the aqueous emulsion of the polymerizable mixture is further defined as a mini-emulsion.

45. The method of claim 31, wherein the monomers are selected from the group consisting of alkyl acrylates, alkyl methacrylates, and mixtures thereof.

46. The method of claim 31, wherein the photochromic compound is selected from the group consisting of chromenes, spirooxazines and mixtures thereof.

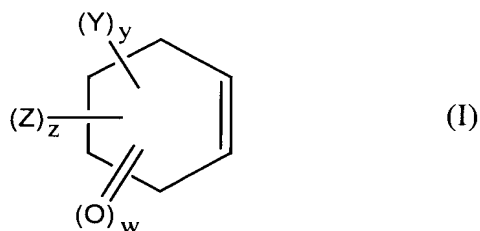
47. The method of claim 31, wherein the photochemical property stabilization agent is added to the polymerizable mixture during polymerization.

48. The method of claim 31, wherein the photochemical property stabilization agent is added to the latex after polymerization.

49. A stabilized photochromic latex comprising:
an aqueous dispersion of polymer particles resulting from the free-radical
polymerization of one or more organic monomers containing C=C groups;
one or more photochromic compounds; and;
an effective quantity of at least one stabilization agent capable of stabilizing
photochromic properties selected from the group consisting of cyclopentene
compounds, cyclohexene compounds, cycloheptene compounds, cyclooctene
compounds, and compounds comprising an ethylenic unsaturation not forming
part of an aromatic ring and a carbon atom bearing a free hydroxy group,
wherein the carbon atom is in the α position with respect to the ethylenic
unsaturation.

50. The latex of claim 49, wherein the stabilization agent is a cyclohexene compound.

51. The latex of claim 50, wherein the cyclohexene compound has the formula:



wherein:

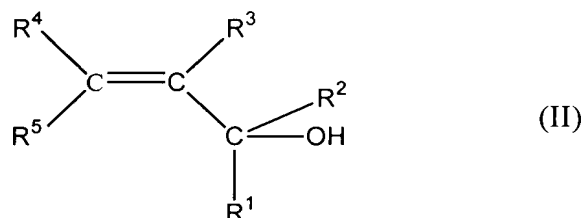
- any Y is, independently, an alkyl group of 1 to 4 carbon atoms;
- any Z is a hydroxy group, a 2-oxoethyl group, a hydroxyalkyl group of 1 to 3 carbon atoms, an alkoxycarbonyl group of 2 to 5 carbon atoms, or a $R'COOR''$ group in which R' is an alkyl radical of 1 to 4 carbon atoms and R'' is an alkane di-yl radical of 2 to 4 carbon atoms or an alkylidene radical of 1 to 5 carbon atoms;
- y is an integer from 0 to 3;
- z is 0 or 1;
- w is 0 or 1; and
- the sum of z and w is 0 or 1.

52. The latex of claim 51, wherein the cyclohexene compound is selected from the group consisting of cyclohexene, α -terpineol, terpinen-4-ol, α -terpinyl acetate, α -terpinyl propionate, α -terpinyl butyrate, 1-methyl-1-cyclohexene, 3-methyl-1-cyclohexene, 4-methyl-1-cyclohexene, methyl 1-cyclohexene-1-carboxylate, 3-methyl-2-cyclohexen-1-ol, 3-methyl-2-cyclohexen-1-one, 4-isopropyl-2-cyclohexen-1-one, 3,5-dimethyl-2-cyclohexen-1-one, 4,4-dimethyl-2-cyclohexen-1-one, isophorone, 2,6,6-trimethyl-1-cyclohexene-1-acetaldehyde, and 3,5,5-trimethyl-2-cyclohexen-1-ol.

53. The latex of claim 51, wherein the cyclohexene compound is cyclohexene.

54. The latex of claim 50, wherein the stabilization agent is a compound comprising:
 an ethylenic unsaturation not forming part of an aromatic ring; and
 a carbon atom bonded to a free hydroxy group and at least one hydrogen atom,
 wherein the carbon atom is in the α position with respect to the ethylenic unsaturation.

55. The latex of claim 50, wherein the compounds with ethylenic unsaturation have the formula:



wherein:

- R¹ and R² are both hydrogen; or one of R¹ and R² is hydrogen and the other forms, with the R⁵ group, a C₅-C₁₀ ring, which may be substituted with one or more linear or branched C₁-C₄ alkyl groups and/or one or more C₂-C₄ alkylene groups; or one of R¹ and R² is hydrogen and the other is a C₁-C₆ aliphatic alkyl group, a C₄-C₁₆ cyclic hydrocarbon group, or a C₆-C₁₆ aromatic hydrocarbon group;
- R³, R⁴, and R⁵, independently, are: hydrogen; a C₁-C₆ alkyl group which may be substituted with one or more OH groups and may be interrupted by one or more ether, ester or ketone groups; a C₆-C₁₆ aromatic hydrocarbon group; or a C₄-C₁₆ cyclic hydrocarbon group; and
- R³ and R⁴ may form a C₅-C₁₀ ring which may be substituted with one or more C₁-C₄ alkyl groups or C₂-C₄ alkylene groups; and
- two or more carbon atoms of any C₅-C₁₀ ring formed with R¹ or R² and R⁵ or with R³ and R⁴ may be bonded by a hydrocarbon bridge.

56. The latex of claim 55, wherein R¹ and R² represent hydrogen, R³ represents a methyl group, R⁴ represents hydrogen or a methyl group and R⁵ represents hydrogen, a methyl, ethyl or CH₂OH group.

57. The latex of claim 55, wherein the compound of formula (II) is selected from the group consisting of allyl alcohol, methallyl alcohol, crotyl alcohol, 2-cyclohexen-1-ol, trans-2-hexen-1-ol, cis-2-butene-1,4-diol, 3-methyl-2-buten-1-ol, trans-2-methyl-3-phenyl-2-propen-1-ol, 3-buten-2-ol, carveol, myrtenol, verbenol and trans-cinnamyl alcohol.

58. The latex of claim 57, wherein the compound of formula (II) is 3-methyl-2-buten-1-ol.
59. The latex of claim 49, further defined as comprising 0.1 to 10% by weight stabilization agent with respect to the weight of monomers in the initial mixture.
60. The latex of claim 59, further defined as comprising 1 to 10% by weight stabilization agent with respect to the weight of monomers in the initial mixture.
61. The latex of claim 60, further defined as comprising about 5% by weight stabilization agent with respect to the weight of monomers in the initial mixture.
62. The latex of claim 49, wherein the polymer is an alkyl polyacrylate, an alkyl polymethacrylate, or a copolymer of alkyl acrylate and alkyl methacrylate.
63. The latex of claim 49, wherein the photochromic compound is selected from the group consisting of chromenes, spirooxazines, and mixtures thereof.
64. A substrate coated with a film formed by drying a stabilized photochromic latex comprising:
an aqueous dispersion of polymer particles resulting from the free-radical
polymerization of one or more organic monomers containing C=C groups;
one or more photochromic compounds; and;
an effective quantity of at least one stabilization agent capable of stabilizing
photochromic properties selected from the group consisting of cyclopentene
compounds, cyclohexene compounds, cycloheptene compounds, cyclooctene
compounds, and compounds comprising an ethylenic unsaturation not forming
part of an aromatic ring and a carbon atom bearing a free hydroxy group,
wherein the carbon atom is in the α position with respect to the ethylenic
unsaturation.

65. The substrate of claim 64, further defined as an ophthalmic lens.